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Presentation Title: Morphology and Migration of Large Sand Dunes Using SRTM and Altimetric Data

Abstract: The poorly understood complex and rapid variations of large sand dune morphologies of the world's deserts have significant importance on conservation and climate change and hence, are of interests to a wide variety of scientific and environmental applications including studies on aeolian processes, paleoclimate, civilian infrastructure management, and design of blown-sand control systems. Based on topographic mapping we know that the Namib desert hosts the worlds tallest sand dunes, however, we still don't know much about the driving forces controlling dune behaviour and migration.

The Shuttle Radar Topography Mission (SRTM, SIR-C and SIR-X) data can be used as a reference digital elevation model (DEM) to investigate and compare morphologic attributes of various sand dunes in parts of the Namib, Gobi, and Mojave deserts. Comparing SRTM DEM's with elevation data based on other geodetic and remote sensing sensors such as ICESat and ASTER, which have a better temporal coverage and operate until present, can substantially improve our understanding of sand dune migration compared to traditional approaches that use sequential topographical surveys over a limited region. To investigate the dynamics and morphology of sand dunes in deserts located globally we apply splines, wavelet analysis, and correlation filtering to construct and compare seasonal DEMs from available satellite altimetric data with regional SRTM DEMs. Another objective is to assess the potential of using space geodetic techniques to quantify topographic changes also using measurements from current InSAR missions (ENVISAT ASAR) and upcoming missions such as ALOS PSAR and RADARSAT-2.